



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/944,545	08/31/2001	Donald R. Mullen	1726.7221000	3037
25697	7590	02/26/2004		
ROSS D. SNYDER & ASSOCIATES, INC. 115 WILD BASIN RD. SUITE 107 AUSTIN, TX 78746				
			EXAMINER OWENS, DOUGLAS W	
			ART UNIT 2811	PAPER NUMBER

DATE MAILED: 02/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/944,545

Applicant(s)

MULLEN ET AL.

Examiner

Douglas W Owens

Art Unit

2811

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 22 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-32 and 34-41 is/are pending in the application.
- 4a) Of the above claim(s) 7-13, 20, 21, 25, 27, 34 and 35 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6, 15-19, 22-24, 26, 28-32 and 36-41 is/are rejected.
- 7) ☒ Claim(s) 14 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on January 22, 2004 has been entered.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 15-19, 28-32 and 36-41 are rejected under 35 U.S.C. 102(b) as being anticipated by US patent No. 5,783,461 to Hembree.

Regarding claim 1, Hembree teaches an IC cover (Figs. 1 & 2) comprising:

a plate portion (20, 24);

an attachment portion (under spring portion (22)) indirectly coupled to a circuit board (16); and

a spring portion (22) coupled to the plate portion and the attachment portion, such that the spring portion is in a non-relaxed state when the attachment portion is coupled to the circuit board. See Col. 3, lines 41 – 45 and particularly Col. 4, lines 22 –

26, where it is explained that the retention clips (26, 28) exert a retention force on the cover. This would have resulted in pressure being applied to the spring portion, such that it would have not been in a relaxed state.

Regarding claim 15, Hembree teaches an IC cover, wherein the spring portion is disposed at an end of the plate portion.

Regarding claim 16, Hembree teaches an IC cover, wherein the spring portion includes a plurality of individual spring elements, wherein a first one of the plurality of individual spring elements is disposed at a first end of the plate portion and a second one of the plurality of individual spring elements is disposed at a second end of the plate portion.

Regarding claims 17 and 19, Hembree teaches an IC cover, wherein the spring elements are disposed around a perimeter of the plate portion.

Regarding claims 18 and 41, Hembree teaches an IC cover, wherein at least one of the spring elements is maintained in a non-relaxed state.

Regarding claim 28, Hembree teaches an IC cover comprising:

an attachment portion (located directly under the spring (22)) indirectly coupled to a circuit board (16), wherein one die (12) is coupled to the circuit board; and

a plate portion (20) of flexible material (Col. 4, lines 14 – 19 discloses that the plate is compressed, so it must be flexible) and exerts pressure to the die.

Regarding claim 29, Hembree teaches an IC cover, wherein the plate portion is formed so as to exert pressure to the die in a direction toward the circuit board.

Regarding claim 30, Hembree teaches an IC cover, further comprising a spring portion (22) coupling the attachment portion to the plate portion.

Regarding claim 31, Hembree teaches an IC assembly (Fig. 2) comprising:

a circuit board (16);

a first die (12) disposed on a first surface of the circuit board; and

a cover including:

a plate portion (20, 24) disposed so as to cover the first die;

an attachment portion (directly under spring (22) and spring (26)) attached to the circuit board; and

a spring portion (22, 26) coupled to the plate portion and the attachment portion such that the spring portion is in a non-relaxed state when the attachment portion is coupled to the circuit board. See Col. 3, lines 41 – 45 and particularly Col. 4, lines 22 – 26, where it is explained that the retention clips (26, 28) exert a retention force on the cover. This would have resulted in pressure being applied to the spring portion, such that it would have not been in a relaxed state.

Regarding claim 32, Hembree teaches an assembly, wherein the spring portion exerts pressure between the plate portion and the first die.

Regarding claim 36, Hembree teaches an IC cover comprising:

a plate portion (24) having a plurality of edges;

a plurality of attachment portions (located under spring (22)); and

a plurality of spring portions coupled to the plate portion and attachment portions, wherein the springs are oriented along a direction corresponding to the plurality of

Art Unit: 2811

edges such that the spring portion is in a non-relaxed state when the attachment portion is coupled to the circuit board. See Col. 3, lines 41 – 45 and particularly Col. 4, lines 22 – 26, where it is explained that the retention clips (26, 28) exert a retention force on the cover. This would have resulted in pressure being applied to the spring portion, such that it would have not been in a relaxed state.

Regarding claim 37, Hembree teaches an IC cover, wherein center lines of the springs are oriented so as to be non-radial relative to a centroid of the plate portion.

Regarding claim 38, Hembree teaches an IC cover, wherein each of center lines of the spring portions are oriented approximately tangentially in relation to a corresponding one of the plurality of edges.

Regarding claim 39, Hembree teaches an IC cover, wherein the spring portions are oriented in a similar rotational direction with respect to a centroid of the plate portion.

Regarding claim 40, Hembree teaches an IC cover, wherein the plurality of spring portions are configured to cooperatively accommodate displacement of the plate portion from a relaxed position.

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 2 – 5 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hembree as applied to claim 1 above, and further in view of US patent application publication No. 2002/0079571 to Takeuchi et al.

Regarding claims 2 and 26, Hembree does not teach an IC cover that is unitarily molded of a polymer material. Takeuchi et al. teaches an IC cover, that is unitarily molded of a polymer material (section [0020] third and fifth sentence). It would have been obvious to one of ordinary skill in the art to incorporate the teaching of Takeuchi et al. into the device taught by Hembree, since the polymer material is a known material that is well suited for the intended use. The selection of a known material based on its suitability for its intended use supported a *prima facie* obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945). Hembree does not teach that the spring portion is a polymer material. Hembree teaches that the spring portion can be formed of an elastomeric material. It would have been obvious to select a polymer material since it is an elastomeric material, as suggested by Hembree.

Regarding claim 3, neither Hembree nor Takeuchi et al. teach an IC, wherein cover, wherein the polymer material has a thermal conductivity of at least 10 watts/meter. Takeuchi et al. teaches that it is desirable to remove excess heat from integrated circuits, as is known in the art. It would have been obvious to one of ordinary skill in the art to provide a polymer material having good thermal conductivity, since it is desirable to remove heat from the IC.

Regarding claim 4, Hembree does not teach an IC cover, further comprising a heat sink coupled to the plate. Takeuchi et al. teaches an IC, wherein a heat sink is coupled to the plate. It would have been obvious to one of ordinary skill in the art to incorporate the heat sink taught by Takeuchi et al. into the device taught by Hembree, since it is desirable to remove excess heat from the IC.

Regarding claim 5, Hembree does not teach an IC cover, wherein the heat sink portion includes extended surfaces. Takeuchi et al. teaches an IC cover, wherein the heat sink includes extended surfaces. It would have been obvious to one of ordinary skill in the art to incorporate the teaching of Takeuchi et al. into the device taught by Hembree for reasons cited above.

6. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hembree and Takeuchi et al. as applied to claim 5 above, and further in view of US patent No. 6,349,032 to Chan et al.

Hembree and Takeuchi do not teach a device, wherein the heat sink portion includes fins. Chan et al. teaches an IC, wherein the heat sink portion includes fins (Fig. 1 (14)). It would have been obvious to one of ordinary skill in the art to incorporate the heat sink with fins into the device taught by Hembree and Takeuchi since it is desirable to provide a means for efficient removal of excess heat from the IC.

7. Claims 22 – 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hembree as applied to claim 1 above, and further in view of Chan et al.

Hembree does not teach an IC cover including a heat sink with extended surfaces comprising fins. Chan et al. teaches an IC including a heat sink with extended



surfaces comprising fins. It would have been obvious to one of ordinary skill in the art to incorporate the heat sink taught by Chan et al. into the IC taught by Hembree, since it is desirable to remove excess heat from the IC.

***Allowable Subject Matter***

8. Claim 14 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Response to Arguments***

9. Applicant's arguments filed January 22, 2004 have been fully considered but they are not persuasive.

Applicant correctly asserts that the subject matter from canceled claim 33 was previously indicated allowable. However, upon closer inspection of the teaching of Hembree, it has been discovered that Hembree does indeed teach that the spring is in a non-relaxed state when the attachment portion is coupled to the circuit board. Note Col. 3, lines 34 – 45, where Hembree discloses that a force applying mechanism (18) is provided, which the spring (22) is a portion thereto. Hembree further teaches in lines 22 – 26 that the clips (26, 28) exert a retention force on the cover. This force would have also been exerted on the springs in such a manner that they would not have been relaxed.


***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Douglas W Owens whose telephone number is 571-272-1662. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie C Lee can be reached on 571-272-1732. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DWO



EDDIE LEE  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800